Recyclability assessment *
Date: March 6, 2023
IBM Power Server 9043 MRX

Brand name =	IBM				
Model name =	9043 MRX		Product weight =	42.51 kg	

Part/Sub-Assembly	Mass (kg)	Qty	Mass/System(kg)	Recyclability rate**	Recyclable mass (kg)
Cassette with no pcie cards and no tailstock blanks	0.375	11	4.13	97%	4.00
PCIe card, Shiner	0.16	4	0.64	97%	0.62
PCIe card, Y4 Crypto @ 474.6gm	0.48	0	0.00	97%	0.00
PCIe card, Bear Mtn	0.3	4	1.20	97%	1.16
PCIe card, NVidia Tesla P4	0.26	0	0.00	97%	0.00
PCIe card, ZR1 @ 0.70 lbs	0.32	0	0.00	97%	0.00
PCIe card, Bono	0.3924	2	0.78	97%	0.76
PCIe card, Castello Crypto	0.335	1	0.34	97%	0.32
eBMC card with Cassette	0.65	1	0.65	97%	0.63
VRM, Vdd (Norgay)	0.33	8	2.64	97%	2.56
VRM, Vdn and Vcs (Gunten)	0.3	4	1.20	97%	1.16
VRM, Vio and standby (Reist)	0.3	2	0.60	97%	0.58
VRM, Vpcie (Marmot)	0.3	2	0.60	97%	0.58
Bellavista with connectors	5	1	5.00	97%	4.85
Stiffener, Bellavista	4.5	1	4.50	97%	4.37
Structural members, Main CEC	3.31	1	3.31	97%	3.21
Sidewalls, Main CEC	0.85	2	1.70	97%	1.65
Fansipan with bus bars and bracket	0.92	1	0.92	97%	0.89
ISDIMM	0.03	0	0.00	97%	0.00
DDIMM, 4U 32GB	0.075	64	4.80	97%	4.66
load DDIMM, 4U	0.055	0	0.00	97%	0.00
DDIMM, 4U carrier	0.005	64	0.32	97%	0.31
DDIMM, 2U carrier	0.03	0	0.00	97%	0.00
CDIMM	0.16	0	0.00	97%	0.00
Heatsink (upstream)	0.865	2	1.73	97%	1.68
Heatsink (downstream)	1.105	2	2.21	97%	2.14
DCM	0.1	4	0.40	97%	0.39
Bezel	0.28	1	0.28	97%	0.27
Power supply, 2300W	1.44	4	5.76	97%	5.59
Power supply, 2000W	1.2	0	0.00	97%	0.00
Chassis without cover	11.095	1	11.10	100%	11.10
Chassis cover	2.49	1	2.49	100%	2.49
Fan, 92 mm	1.12	4	4.48	97%	4.35
Basecamp	0.6	1	0.60	97%	0.58
Front drive sheetmetal assembly with no drives, no op panel, SSDs	4.39	1	4.39	100%	4.39
NVMe drives, 15mm	0.26	10	2.60	97%	2.52
NVMe drives, 7mm	0.11	0	0.00	97%	0.00
Op panel Display	0.185	1	0.19	97%	0.18
Lift Handles, Removeable	0.205	6	1.23	97%	1.19
Sum ***			70.77		69.19

Recyclability rate: R_{rcy} = $\sum m_{(i)} \times RCR_{(i)} / m_{EEE} \times 100\%$ = 97.8

Symbols and definitions

$m_{(i)}$ = Mass of i^{th} part

$RCR_{(i)}$ = Recycling rate of the i^{th} part in the corresponding end-of-life treatment scenario

R_{rcy} = Recyclability rate

m_{EEE} = Total product mass

* This recyclability assessment is based on the format in the International Electrotechnical Commission (IEC) 62635 Standard Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment. Recyclability is defined by the standard to be "ability of waste product to be recycled, based on actual practices." The recyclability rate calculation equation is defined by this standard. Products were assessed based on the results of reuse, recycling,and/or disposal at IBM's Product End-of-Life Management suppliers. The 2018 results for IBM product end-of-life management are attached to the right. The IBM and the Environment 2018 Annual report is located at https://www.ibm.com/ibm/environment/annual/reporting.shtml

** Assumptions - Recyclability rates projected for this product and parts are based on knowledge of the product material composition, publically available reference sources for recyclability of materials (see references below) and on the overall results of IBM's product end-of-life management venders. Where there is a publically available recyclability rate for a commodity or assembly, such as those in the JRC Technical Report below, that rate is used. Where there is not a publically available recyclability rate, the overall rate of 97% was chosen because that is the documented and actual recycling rates from IBM Product End of LIfe Management vendors. The 97% is the actual recyclability of IBM products as reported from IBM PELM vendors and the available infrastructure. According to NSF/ANSI 426-2018 - Printed circuit board substrate material, included in printed circuit boards that will be sent to a smelter for metals recycling, shall be considered recyclable for the purpose of the calculation.

*** This POWER server is unique in content based on customer ordering. The weight will vary based on content of the server. The bill of material provided here is an example for this product and that which is used for the Installation Planning manual.

**** References: IEC/TR 62635, "Technical Report IEC/TR 62635. Guidelines for End of Life information provision from manufacturers and recyclers, and for recyclability rate calculation of Electrical and Electronic Equipment." The International Electrotechnical Commission (IEC), 2012;
P. Chancerel and M. Marwede, JRC Technical Reports, Feasibility study for setting-up reference values to support the calculation of recyclability / recoverability rates of electr(on)ic products August 2016; and NSF/ANSI 426 - 2018 Environmental Leadership and Corporate Social Responsibility Assessment of Servers

End of life treatment methodology - The methodology for recycling technologies and practices for this product generally follow the end-of-life treatement process as outlined by IEC/TR62635. See the process flow diagram to the right. Disassembly of the product is required to sort into recycling streams based on the infrastructure available to the dismantler. Generally circuit cards, backplanes, processors, etc. would go to a precious metal recycler. Metal covers, chassis, brackets, screws, etc to a metal smelter. Plastic parts such as the bezel, covers, etc. would go to a plastic recycler.
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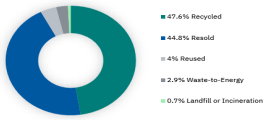
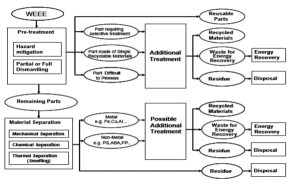
Product end-of-life processing methods





End-of-life treatment processes from IEC/TR 62635